

WHAT IS CLAIMED IS:

1. A cutting tool insert for machining steel, comprising a cemented carbide body and a coating, wherein:

the cemented carbide body comprises WC, 2-10 wt. % Co, 4-12 wt. % of
5 cubic carbides of metals from groups 4, 5 or 6 of the periodic table, and N in an amount of between 0.9 and 1.7% of the weight of the elements from groups 4 and 5;

the cemented carbide body comprises a Co-binder phase which is highly alloyed with W, and has a CW-ratio of 0.75-0.90;

10 the cemented carbide body has a surface zone with a thickness of $< 20 \mu\text{m}$, which is binder phase enriched and essentially cubic carbide free;

the cemented carbide body has a cutting edge which has a binder phase content of 0.65-0.75 by volume of the bulk binder phase content, and the binder phase content increases at a constant rate along a line which bisects said cutting
15 edge until it reaches the bulk binder phase content at a distance between 100 and 300 μm from the cutting edge; and

the coating comprises a 3-12 μm columnar TiCN layer followed by a 2-12 μm Al_2O_3 layer.

2. The cutting tool insert of claim 1, wherein the cemented carbide
20 body comprises more than 1 wt. % of each Ti cubic carbide, Ta cubic carbide and Nb cubic carbide.

3. The cutting tool insert of claim 1, wherein the amount of N in the cemented carbide body is between 1.1 and 1.4% of the weight of the elements from groups 4 and 5.

4. The cutting tool insert of claim 1, wherein the binder phase content of the cutting edge of the cemented carbide body is 0.7 of the bulk binder phase content of the cemented carbide body.

5. The cutting tool insert of claim 1, wherein the distance from the cutting edge at which the binder phase content reaches the bulk binder phase content is between 150 and 250 μm .

6. The cutting tool insert of claim 1, wherein the surface zone of the cemented carbide body is 5-15 μm thick.

7. The cutting tool insert of claim 1, wherein the cemented carbide body comprises 4-7 wt. % Co and 7-10 wt. % of the specified cubic carbides.

8. The cutting tool insert of claim 1, wherein the Al_2O_3 coating layer is $\alpha\text{-Al}_2\text{O}_3$.

9. The cutting tool insert of claim 1, which has an outermost coating layer of TiN.

10. The cutting tool insert of claim 1, wherein the average WC-grain size is between 2.0 and 3.0 μm .

5 11. A method of making a cutting insert comprising a cemented carbide body having a binder phase, with a binder phase enriched surface zone, and a binder phase depleted cutting edge, and a coating, comprising the steps of:

forming a powder mixture containing WC, 2-10 wt. % Co, 4-12 wt. % of cubic carbides of metals from groups 4, 5 or 6 of the periodic table, the binder phase having a CW-ratio of 0.75-0.90;

10 adding N in an amount of between 0.9 and 1.7% of the weight of the elements from groups 4 and 5;

mixing said powder with a pressing agent;

milling and spray drying the mixture to a powder material;

15 compacting and sintering the powder material at a temperature of 1300-1500°C, in a controlled atmosphere of sintering gas at 40-60 mbar followed by cooling;

applying post-sintering treatment; and

applying a hard, wear resistant coating by CVD- or MT-CVD-technique.

12. The method of claim 11, wherein the powder mixture comprises 2-7 wt. % Co.

13. The method of claim 11, wherein the powder mixture comprises 7-10 wt. % of cubic carbides of the metals from groups 4, 5 or 6 of the periodic table.

14. The method of claim 11, wherein the powder mixture comprises more than 1 wt. % of each Ti cubic carbide, Ta cubic carbide and Nb cubic carbide.

15. The method of claim 11, wherein N is added in an amount between 1.1 and 1.4% of the weight of elements from groups 4 and 5.

16. The method of claim 11, wherein N is added to the powder mixture as a carbonitride.

17. The method of claim 11, wherein the N is added during the sintering step as part of the sintering gas atmosphere.

18. The method of claim 11, wherein the sintering is carried out at about 50 mbar.

19. The method of claim 11, wherein the hard, wear resistant coating is a 3-12 μm columnar TiCN layer followed by a 2-12 μm Al_2O_3 .

20. The method of claim 11, wherein W is added to the powder mixture with the pressing agent, so as to achieve the CW-ratio of 0.75-0.90.

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